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10/522455

DT01 Rec'd PCT/PTO 21 JAN 2005

PORE BURNER AND COOKING APPLIANCE CONTAINING AT ~~LEAST ONE PORE BURNER~~

Description

The present invention concerns a pore burner, especially for cooking appliances, with a housing having at least one inlet for gas/air mixture as fuel and/or at least one inlet for air and/or at least one inlet for gas and/or at least one outlet for air and/or gas and/or exhaust, as well as a cooking appliance containing at least one pore burner.

The invention also concerns a pore burner system, as well as the use of pore burners and pore burner systems for heat and/or steam generation in cooking appliances and heating appliances, as well as finally these cooking and heating appliances.

Pore burners are adequately known to one skilled in the art. These generally involve a burner with a stipulated combustion chamber volume with spatially connected cavities, through which or in which a defined flame zone is formed. Variants of known pore burners are described, for example, in US 5,522,723, WO 95/01532, DE 199 39 951 A1 and DE 199 04 921 C2. For example, by means of pore burners the size of industrial and household steam and hot water vessels can be reduced, since the heat energy is released both by radiation and by heat conduction so that the convective fraction of heat transfer is reduced. For example, a housing vessel is described in DE 199 04 921 C2 that includes a pore burner suitable for heating of liquids, in addition to a radiation heat exchanger and a convection heat exchanger. A large water space vessel for generation of steam and/or hot water equipped with a pore burner is found in DE 198 04 267 A1.

Especially with a compressed design and high surrounding temperatures, according to DE 199 39 951 A1, a frequently occurring flashback or deficient flame stability under these conditions, for example, caused by pressure fluctuations and partial vacuum, is avoided by the fact that the pore size of the pore burner increases in the direction of flow. In this case a critical Péclet number must be maintained for the pore size in one zone of the porous material, above which flame development occurs and below which it is suppressed. In a pore burner as described in DE 199 39 951 A1, reaction of the fuel/oxidizing agent mixture occurs within the porous matrix. This porous matrix is preferably produced by packings made of temperature-resistant

ceramic spheres or saddles. Filler packings according to DE 199 39 951 A1 accordingly have at least two zones of packing material with different pore size. WO 95/01532 also deals with the problem of generating a stable flame at low temperature and low pollutant emission. It can be gathered from this document that the porosity of the pore burner is changed along the combustion chamber so that the pore size increases in the flow direction of the gas/air mixture from the inlet to the outlet. The employed porous material of the pore burner is again obtained by a packing, for example, in the form of loosely layered grains that are solidified in a sintering process. Finally, basic variants for pore burner technology are described in EP 0 840 061 A1 and in DE-OS 2 211 297.

In the pore burners known from the prior art just described, the reactions between the combustion gas and the oxidizing agent underlying flame formation generally occur mostly or fully within the porous matrix. The hot reaction products therefore emerge from the burner cavities without flame formation. This procedure means that flames are cooled by the burner material, which helps to prevent further flame propagation as well as flashback. However, if the burner masses and burner loads are chosen very small, flashback can occur. For example, this is regularly the case, if high temperatures are present in compact heating appliances because of high surrounding temperatures even in the combustion chamber itself. Flashback can often be reached merely because of sufficient flame cooling. However, a large mass with high heat capacity and good thermal conductivity is required for this. Another common feature of the described pore burner devices is that optimized gas homogenization and gas distribution over the burner surface, as well as sufficient flame stability as well as shape stability of the surface are regularly achieved only by using several components of different geometries and/or materials.

Appropriate flat flame burners based on pore burners have thus far been known only in the form of sintered discs, for example, as flat flame burners according to the so-called "Kaskan type" (according to W.E. Kaskan, "The dependence of flame temperature on mass burning velocity", 6th Symposium (International) on Combustion, The Williams & Wilkins Company, Baltimore, 1956, pages 134 to 143).

A high degree of flame stability, the prevention of flashback and ensuring a uniform and constant flame front in a flat flame burner can regularly be obtained only with a porous material of high homogeneity, since otherwise a nonuniform flow profile generally results. A porous matrix with sufficiently high homogeneity, however, for the most part can only be implemented up to a stipulated component size. For larger dimensioned burner units, trade-offs with respect to uniform flow

profile and therefore the accompanying properties must therefore regularly be tolerated.

Ordinary fully premixing burners, especially flat burners and flat flame burners have thus far generally been made from sheet metal provided with holes and/or slit patterns, for example, as known for burners in cylindrical combustion chambers. For roughly homogeneous distribution of the gas mixture, additional sheets are also required with a coarser perforation, which are situated beneath the aforementioned sheet. Only with these design stipulations is it possible to regularly adjust the flow rates so that the corresponding gas/air mixture can be fed to each site in the appropriate amount. Known flat burners can also consist of a flexible wire mesh, perforated ceramic or wire fabric fastened to a support structure. However, for gas homogenization and gas distribution as well as flame stability and shape stability of the surface, the combination of several components of different geometries and materials is always required.

Thus far, conventional heating systems with electrical or gas-driven heating elements have been generally resorted to for cooking appliances. Improving the efficiency of such heating systems would contribute to a saving of natural energy resources and a reduction in pollutant emissions.

It would therefore be desirable to be able to resort to cooking appliances that have a very energy-efficient and low-pollutant and therefore ecologically efficient heating system, regardless of their size.

Pore burners now available are often also characterized by the fact that, when fully premixed gas/air mixtures are used, sharply differing compositions as well as very variable volume flows can be implemented at low surface load. Especially when a homogeneous gas mixture is used, very low exhaust emissions are obtained. However, it is also observed in these pore burners that, when the burner is in the so-called cold state and the employed gas mixture only has a very low energy content, for example, with a very high air ratio and/or low heating value of the combustion gas, ignition by spark ignition often fails. Even when spark ignition occurs under the conditions just outlined, the energy introduced by the sparks is often only sufficient for local ignition of the gas mixture because of the desired stabilization of the reaction zone in the vicinity of the porous material. Liberated heat of reaction is absorbed by the surrounding material so that energy is removed from the gas mixture in the ignition zone and the chain branching reactions required for flame formation are suppressed.

The above drawbacks can be more or less avoided by using a strong ignition coil with high ignition energy, high ignition frequency and/or by the simultaneous use of several ignition electrodes, but these expedients require additional space and result in additional costs so that the original advantage of pore burners is qualified again. The same is true, if permanent ignition by means of an auto-igniter or ignition burner are provided instead of ignition coils or ignition electrodes.

The task underlying the present invention was therefore to make pore burners available for cooking appliances in particular and to modify the generic pore burners so that they are no longer burdened with the drawbacks of the generic pore burners and, in particular, have a high degree of flame stability and homogeneity, especially when designed as flat burners or flat flame burners. Accordingly, another underlying task of the present invention was to modify a generic cooking appliance so that it can be heated with high energy efficiency constantly and efficiently from an ecological standpoint with the lowest possible operating costs. Finally, another task underlying the present invention was to furnish a pore burner that guarantees improved ignition regardless of the energy content of the fuel mixture or the condition of the pore burner and helps to avoid delayed ignition.

This task is solved according to the invention by pore burners with a housing having sintered metal powder and/or especially pressed metal wire mesh in the form of at least one dimensionally stable, porous molded element, on whose surface and/or in whose pore spaces reaction zones for flame development are present to form a flat burner. Accordingly, the entire molded element surface can also represent the outlet of the pore burner according to the invention, because of the porous structure and optionally also without a defined, large-surface outlet, for example, on one end of the housing. The pore burner according to the invention regularly has at least one inlet for a gas/air mixture as fuel. In addition or as an alternative, the pore burner or housing of the pore burner can have at least one additional inlet for air and/or an additional inlet for gas. For example, separately supplied air can be used as secondary air or also for the cooling of components of the pore burner. So-called fully premixing burner systems are used preferably, especially in cooking appliances.

The pore burner according to the invention can be used, for example, for heat and/or steam generation in cooking appliances, especially gas-heated cooking appliances and also in heating appliances, like heating vessels or gas heating appliances, for example, in the household, especially when using cylindrical combustion chambers.

The pore burners according to the invention, used in cooking appliances, for example, can represent partially premixing and especially fully premixing pore burners. In this case the burners can be a cylindrical tube preferably closed on one end. The application of gas outlet openings distributed on the periphery of the tube has also been shown to work.

It can be prescribed according to the invention that the molded element be an essentially hollow element, especially a hollow cylinder. Appropriate hollow elements can also have arbitrary geometric shapes, for example, an ellipse, triangle, square, rectangle or any polygon in cross section. Appropriate hollow elements can also fully dispense with a defined, large-surface outlet opening and be designed, for example, as an ellipse, sphere or cylinder with only at least one defined opening for inlet of the gas/air mixture. By using hollow elements it is possible in a simple manner to create the largest possible surface for a uniform flame front.

It has turned out to be very advantageous that pore burners are accessible, in which the molded elements include at least one mounting and/or fastening element, especially a groove, a tongue, a flange and/or a thread. Mounting and fastening elements can be integrated with the pore burners according to the invention already in the dimensionally stable molded elements, for example, from pressed metal wire mesh, so that the production costs of the pore burner according to the invention can be reduced and production for large series can be implemented much more easily. Naturally, the dimensionally stable molded element can also be simply welded on for fastening, for example, on the tube to supply the fuel mixture. This can be achieved in particularly simple fashion, if both the tube and the dimensionally stable molded element have corresponding cross-sections and the molded element is configured cylindrical and the tube has a circular cross-section.

Particular advantages with respect to handling and minimization of components are obtained by the fact that the mounting and fastening device is incorporated directly in the porous molded element material of the pore burner. For example, a thread can be made in the pore element. Consequently, no additional mounting or fastening devices and no joining technique for coupling to the pore burner are required.

According to another aspect of the invention, pore burners containing at least two molded elements lying one against the other in form-fit fashion at least in sections are present, which are connected to each other in areas, preferably to form a groove.

By combining dimensionally stable molded elements in form-fit fashion, large-dimensioned pore burners can also be made without having to tolerate drawbacks with respect to uniform gas passage or uniform flow profile. Two or more assembled molded elements can enter into a stable connection via a bevel or groove. It is particularly advantageous if the adjacent molded elements can be joined or inserted one in the other flush and firmly, for example, via a groove/tongue structure, without requiring additional fastening devices. However, it can be necessary to permanently fasten coupled molded elements by means of spot welding. The molded elements are then preferably only joined together at very few adjacent sites and secured against loosening. A constant material density therefore remains even in the region of joints so that a uniform flow profile is guaranteed. To the extent that in very large molded elements of the aforementioned type high homogeneity of the porous material and therefore the most uniform possible flow profile cannot always be maintained, with the variant just described pore burners of larger size become accessible, which have an extremely uniform flow profile over their entire burner surface. In a preferred variant, the dimensionally stable molded elements, especially hollow elements, are designed in their end regions or head surfaces so that they correspond to each other in shape so that the front region of one molded element is inserted to fit in the rear region of another molded element, especially one of identical design. Pore burners can therefore be obtained that can be arbitrarily extended in length without having to tolerate the drawbacks with respect to homogeneity.

It has therefore turned out to be particularly advantageous that the pore burner according to the invention can be converted as such to a stable shape or be present in a stable shape configured so that two or more such pore burners can be connected to each other. For example, adjacent pore burner segments to be connected to each other can be configured on their sections being coupled so that they can be inserted one into the other without requiring additional fastening devices. According to one variant, for example, the open end section of one pore burner segment can be provided with at least one groove that can be connected to fit with an end section of an adjacent pore burner segment provided with at least one tongue. The shape stability of the employed pore burners is then already achieved during production by sintering of metal powder and pressing of metal wire mesh without requiring additional mechanical support elements. Naturally it is possible to couple not only two pore burners via groove/tongue elements corresponding to each other, but three or more pore burners or pore burner segments can be coupled to each other by means of the aforementioned joining technique to form a uniform pore burner. The end piece of this combined pore burner then preferably has a closure, for example, in the form of porous burner material so that the pore burner has no outlet opening. A one-piece

pore burner, like a pore burner segment, can be configured both cylindrically and conically. The same applies to a pore burner formed from several pore burner segments. The pore burner then preferably tapers in the direction toward the end.

It can be prescribed according to the invention that the material densities of at least two adjacent molded elements essentially correspond.

It has also turned out in this context to be a preferred variant in which the material density in the region of the joining site of two joined molded elements corresponds especially to the material density of at least one of these molded elements.

Another embodiment according to the invention is characterized by the fact that the surface of the molded element has at least one irregularity, especially at least one indentation and/or elevation that deviates from the base surface of the molded element.

By means of indentations and/or elevations, i.e. irregularities in the surface of the molded element, formation of an essentially two-dimensional reaction zone is regularly prevented. Such surfaces, which do not have a continuously uniform surface and therefore uniformly repeating structures are preferred accordingly. For this purpose it is generally already sufficient to use molded elements, especially hollow elements with different material thicknesses, especially if they are based on a sintered metal powder. In this way development of self-induced oscillations on the burner surface is already prevented. The surface of the dimensionally stable, especially pressed metal wire mesh is already sufficiently irregular in general as such in order to suppress the described resonance phenomenon, but naturally can also have different thicknesses.

As a result, one variant proposes that the wall thickness of one molded element be varied and especially that it have at least two different thicknesses. The wall thickness of one hollow element in this variant does not have to be constant within it.

Preferred pore burners according to the present invention are flat flame burners.

Particularly preferred pore burners are characterized by the fact that the molded element has a compressed density in the range from about 2.5 to about 5

g/cm^3, especially about 2.8 to about 4.5 g/cm^3, at least in areas, especially in the area of the metal wire mesh. Lower press densities generally require lower blower power because of the smaller pressure losses, whereas more uniform reaction zones can be achieved with higher press densities. The pressed metal wire meshes according to the invention, just like the sintered metal powder molded parts, are already stable as such and do not require any stabilizing elements, for example, in the form of perforated sheets, in order to produce functionally capable flat flame burners, for example, to provide mixture guiding or for shaping.

Such pore burners are also advantageous in which the wire diameter of the metal wire mesh lies in the range from about 0.1 to about 0.4 mm, especially from about 0.16 to about 0.28 mm. In addition to compressed density, the porosity of the pore burner according to the invention based on pressed wire meshes can also be influenced by the wire thickness, i.e., the wire diameter and/or the number of pressed wires in the mesh. For example, if the wire mesh consists only of a relatively thick wire, the pore burner generally has relatively large pores with essentially corresponding pore sizes. If, on the other hand, three wires with smaller diameters are used, pores of different size are generally obtained with the same compressed density, which, however, generally lies on the average below the variant just described.

Pore burners according to the invention containing metal wire meshes accordingly also have, advantageously, 1 to 5, especially 1, 2 or 3 metal wires.

It can then be prescribed according to the invention that the metal wire mesh be axially or radially wound before pressing.

Pore burners according to the present invention are also preferred with which surface loads in the range from 20 to 300 W/cm^2, especially from 30 to 260 W/cm^2 are accessible. Accordingly, in the pore burners according to the invention the flame does not go out even at 200 W/cm^2 or more. The maximum surface load is then often restricted not by the wire mesh but by the feed power of the air and/or gas feed. The surface load lower limit is regularly formed by the fact that the flame is extinguished as a result of high heat conduction on contact with the metal surface. With a three-wire metal mesh based on a heat-resistant steel, for example, 1.4828, with a compressed density of about 3.8 g/m^3, surface loads in the range from about 30 to 160 W/cm^3 can be achieved without difficulty. The pore burner according to the invention therefore permits a very broad range of possible operating states between flame extinction on the one hand and flame raising on the other, and therefore also a power modulation range of 1:5 or more. For example, at a surface load of about 70 W/cm^2

with an air ratio of about $\lambda = 1.2$ an incandescent wire mesh is obtained. During a reduction in air ratio, incandescence will occur at higher powers and at higher air ratios the surface only radiates at very low power. With increasingly more intense incandescence, the percentage of heat transported by radiation from the reaction zone becomes increasingly larger.

It is proposed in another variant according to the invention that the metal powder and/or metal wire mesh includes at least one metal and/or metal alloy that forms an oxide layer, especially a metal alloy containing chromium and/or aluminum. Heat-resistant materials, for example, heat-resistant steels, are considered appropriate metals and metal alloys for the metal powders being sintered and especially for the wire mesh. These include, for example, high-alloy steels, like low-carbon austenitic chromium, nickel and manganese steels. The heat-resistant steel 1.4828 (X15 CrNiSi 20-12) can be referred to as an example. Those metal or metal alloys that can form an oxide layer on their surface are also readily suited so that the molded articles can be provided with a protective layer. Particularly appropriate metal alloys have aluminum and/or chromium fractions or consist of these metals. An appropriate material, for example, is the alloy with material number 1.4767 (CrAl 20 5), as well as alloys with the material number 1.47675.

The task underlying the invention is solved according to another aspect by a pore burner having at least one distribution device for deliberate alignment of one part of the gas and/or air stream and/or the gas/air mixture stream, which can be arranged and/or molded at least in sections in the hollow element of the pore burner, so that part of the air and/or gas stream or the gas/air mixture stream can be distributed in a manner so that the inside wall of the hollow element experiences a nonhomogeneous pressure distribution, especially in the region of the distribution device.

Whereas the gas/air mixture enters the cavity essentially uniformly in ordinary pore burner cavities, it is possible in the device according to the invention to deliberately divert part of the gas/air mixture stream to one region of the inside wall of the pore burner hollow element. The gas/air mixture is fed to this selected region on the inside wall with a stronger pressure than to the surrounding areas of the hollow element.

In a preferred variant it is prescribed that the distribution device represents a baffle plate.

It can then be further prescribed that the distribution device includes essentially metallic and/or ceramic materials and is made, for example, from stainless steel.

The distribution device can be present, for example, in the form of a plate or a three-dimensional structure, for example, a wedge, at least in sections in the hollow element as long as it is guaranteed that the gas entering the hollow element is diverted partly to one region of the inside wall of the hollow element. The distribution device can be an arbitrarily shaped diversion or deflection structure extending obliquely, i.e., at an angle, into the hollow element. Naturally, the distribution device, especially the baffle plate, can have not only a diversion or deflection surface, but be arbitrarily shaped, provided that mounting and/or the configuration of the distribution device permits partial deflection, as just explained, of the entering combustion gas. For example, the distribution device or baffle plate can have a round, oval or angular cross-section. In principle, the cross-sectional shape of the distribution device can always be easily adjusted to the cross-sectional shape of the pore burner hollow element. The distribution device or baffle plate can also be configured kinked, annular, step-like or bent.

In another embodiment, it has proven advantageous, if the distribution device or baffle plate has at least one passage or opening. By using such perforated distribution devices, the amount of gas to be diverted can be influenced particularly effectively and it can be ensured that a sufficient amount of combustion gas always reaches the remaining section of the hollow element of the pore burner following the distribution device so, that the entire pore space and its surface can be utilized for flame formation.

According to a particularly preferred variant, the size of the passages in the distribution device, especially during pore burner operation, is variable. In this manner it is possible, for example, to immediately react to changes in composition of the fuel mixture in order to guarantee continuous, uniform flame formation over the entire pore burner.

The pore burners according to the invention can also have at least one burner tube for air and/or gas that can be connected to an inlet of the pore burner. This burner tube is generally a component of the supply line.

The distribution device can be present both in sections in the hollow element and also in the burner tube or be fully present in it or mounted in it.

It can then be prescribed that the distribution device can be fastened at least in sections to the burner tube and/or hollow element. Generally it is sufficient if the distribution device is fastened via one or two spot welds on the inside of the burner tube. In this case it has proven advantageous, if the distribution device has no direct connection to the hollow element.

Another advantageous embodiment is characterized by the fact that the deflection surface of the distribution device, especially the baffle plate, is sloped relative to the center axis of the hollow element, especially of the hollow cylinder.

In principle, a slight slope, for example, of the baffle plate relative to the center axis of the hollow element is already sufficient to supply a selected region on the inside surface of the pore burner hollow element with the fuel mixture in a preferential fashion, i.e., with a higher pressure. Slope angles in the range from 10 to 45°, especially from 15 to 30° have proven to be particularly advantageous. The distribution device can naturally also have a blade shape or be bent.

Optimal results are then regularly obtained, if the maximum cross-sectional surface of the distribution device in the direction of flow of the gas/air mixture is more than 50%, preferably 55 to 75% of the cross-sectional surface of the hollow element in the region of the distribution device. Appropriately, sufficient combustion gas should always go past the edges of the distribution device and/or pass through openings in it into the sections of the pore burner hollow element that follow the distribution device.

Another variant according to the invention has pore burner systems as object, which include at least one feed tube for air and/or gas, which can be connected to an inlet of the pore burner, and/or at least one ignition device.

It can then be prescribed according to the invention that at least one inlet of a dimensionally stable molded element be connected via a mounting and/or fastening element, especially a flange and/or a thread, to at least one feed tube and/or burner tube for air and/or gas.

It can also be prescribed according to the invention that at least one inlet of a dimensionally stable molded element be at least partially welded to at least one feed tube and/or burner tube and/or gas.

It can also be prescribed according to the invention that the ignition device be arranged in the region of the outside of the hollow element in the region on whose corresponding inside the distribution device has the smallest spacing. The ignition device, for example, ignition electrode, accordingly preferably lies where the diverted combustion gas mixture emerges from the pore burner wall so that the flame is regularly ignited with the first ignition spark. The reaction front continuously propagates afterward.

According to another aspect of the present invention, the task is also solved by a cooking appliance, especially a gas-heated cooking appliance containing at least one pore burner, especially a pore burner according to the invention or a pore burner system according to the invention. Those with closed and open systems are considered as cooking appliances. Gas-heated cooking appliances, especially those with a pore burner that functions as a flat burner or flat flame burner are preferably resorted to. The smallest cooking appliances, for example, kitchen cooking appliances can then also be equipped with pore burners, especially pore burners according to the invention just like large cooking appliances that are used in large kitchens, for example. Appropriate areas of application for the pore burners according to the invention include steam cooking appliances or also so-called Combi-steamers.

A very high degree of flame stability is achieved with the pore burners according to the invention. At the same time, flashback is essentially fully prevented. Pore burners are therefore provided with a porous material of high homogeneity and uniform flow profile that have a uniform and constant flame front as surface burners and are suitable in particular as flat flame burners. A quasi-two-dimensional flat flame is maintained over the entire burner surface with the pore burners according to the invention. The cooking appliances according to the invention have a very high efficiency and can be operated with exceptional ecological efficiency, for example, resource-sparing and low-pollution. The heat input is then very uniform and can also be precisely regulated and controlled directly and simply. The properties just described can also surprisingly be implemented with cooking appliances according to the invention that are dimensioned small. The cooking appliances according to the invention can therefore be used both in large kitchens, for example, cafeteria operations, and also in restaurants and guest houses. Cooking appliances with flat burners accommodated in them are therefore accessible without difficulty.

The surprising finding that by means of a distribution or guide device mounted in the internal space of a pore burner hollow element at least part of the introduced or

blown-in gas/air mixture is deliberately fed to a specific region of the inside wall of this hollow element also forms the basis of the present invention. In this way fuel supply can be reliably achieved, which is always sufficient to be ignited with an ignition spark. In particular, pore burners can be ignited without problem independently of their initial state and independently of the quality of the gas/air mixture. Because the gas/air mixture emerges outward within a defined region through the porous hollow element, the reaction can be started and also maintained via an ordinary ignition device mounted in the region of the preferred fuel outlet. The pore burner according to the invention functions without problem and reliably under a wide variety of reaction conditions just because of this not very demanding design expedient. It is also advantageous that no trade-offs need be made with respect to the compact design of the pore burners. It is of particular advantage that the spacing between the surface of the pore burner and the combustion chamber boundary can be kept very low. This could not be easily achieved with ordinary burner types, since increased flow velocities always accompany a reduction in spacing, which thus far has often led to the extinguishing of flames. In addition, a persistently high degree of flame stability is achieved and flashback is essentially fully prevented.

Additional features and advantages of the invention are apparent from the following description, in which preferred variants of the invention are explained in detail with reference to the schematic drawings. In the drawings:

Figure 1 shows a schematic layout of a cooking appliance according to the invention containing a pore burner;

Figure 2 shows a hollow cylindrical pore burner in cross section;

Figure 3 shows a schematic perspective view of a pore burner according to the invention;

Figure 4 shows a schematic cross-sectional drawing of the pore burner according to Figure 3; and

Figure 5 shows another schematic cross-sectional view of the pore burner according to Figure 3.

The cooking appliance 1 depicted in Figure 1 includes an internal space 2 with a pore burner 4 according to the invention to generate hot air. As an alternative or in addition, steam can also be generated with the pore burner 4 or an additional pore

burner (not depicted). To monitor the burner function, each pore burner 4 has a sensor (not shown) in the form of an ionization current sensor as well as an ignition device (not shown). The pore burner 4 is supplied with combustion gas or a combustion gas mixture via a supply line 6 by means of a first gas fitting (not depicted). This gas fitting assumes the function of pressure control, amount adjustment and optionally gas filtering. The pore burner 4 is designed as a hollow cylinder and has a thread on one end that is integrated in one piece in the molded element forming the pore body (not depicted). The dimensionally stable molded element 7 present in this variant as a pressed wire mesh can be screwed directly to a base 8 via this thread so that a reliable connection with the supply line 6 is already guaranteed without requiring additional components, which also makes it possible to exchange different pore burners 4 or molded elements 7 with each other in simple and uncomplicated fashion.

Figure 2 is a schematic depiction of a pore burner 4' in cross section. The wall 10 of the hollow cylindrical-shape molded element 7' of pore burner 4' has irregularities 12 and 14 in the surface 16 of the molded element, which come down to different thickness of the molded element wall 10. In pore burners according to the invention configured in this way, the phenomenon of combustion-related, self-induced oscillations no longer regularly occurs. By designing the irregularities 12 and 14 of molded element 7' as grooves that can engage one in the other, larger-dimensioned pore burners can be created with these molded elements 7', which can be positioned one against the other in form-fit fashion. The groove 12 of a first molded element 7' then engages in the groove 14 of a second molded element 7' whose free groove 12 can again be combined with the groove 14 of a third molded element 7' with shape mating.

Figure 3 is an alternative pore burner system 3' according to the invention, containing a pore burner 4'' according to the invention with a burner tube 24, a feed tube 26 connected to it, as well as a flange 28 connected directly to the feed tube 26. The flange 28 has several screw holes 34 for mounting, for example, in a cooking space of a cooking appliance or in a steam generation unit of a cooking appliance. A mount 36 for the ignition source 22 is also mounted on flange 28. The baffle plate 100 extends into pore burner 4'', which is configured in the form of a hollow cylinder. This baffle plate 100 is arranged so that it supplies part of the gas/air mixture reaching the internal space of pore burner 4'' via the feed tube 26 and burner tube 24 deliberately to a defined region of the inside wall of the pore burner 4''. For this purpose it is already sufficient, if the baffle plate 100 is sloped relative to the center axis of the hollow cylindrical pore burner 4'' in the direction toward the inside

wall of this hollow cylinder. For example, an essentially rectangularly shaped baffle plate 100, shown in Figure 3, can extend obliquely into the internal space of the hollow cylinder. If the baffle plate 100 is also present in sections in the burner tube 24 or mounted there in sections, the gas/air mixture arriving via the feed tube is channeled in parts in timely fashion in the direction toward the desired region of the inside wall of the pore burner. In this manner ignition is possible in an early section of the pore burner body fully without problem. In a preferred variant the baffle plate 100 can also be arranged moveable or rotatable within the hollow cylinder. For example, during use of a high-energy gas/air mixture, its channeling is unnecessary, since ignition problems need not be reckoned with, for which reason it would work to align the baffle plate 100 parallel to the center axis of the hollow cylinder. Because of the proximity of the ignition source to the region on the outside of the pore burner 4'' in which a particularly large amount of gas/air mixture emerges, it is ensured by simple and reliable means that even a single ignition spark is sufficient to set combustion in motion. Naturally, in another variant, the ignition source 22 mounted on the holder 36 can naturally be arranged rotatable so that it is only brought to the outside of pore burner 4'' in the case of ignition.

Figure 4 shows a section of the pore burner system 3' or pore burner 4'' depicted in Figure 3. It is apparent here that the baffle plate 100 already begins in burner tube 24 and extends into the internal space of pore burner 4''. The baffle plate 100 is preferably fastened in the region of burner tube 24. The gas/air mixture introduced by a feed tube 26 encounters the baffle plate 100 in burner tube 24 and is deflected by it partially in the direction toward the inside wall region of pore burner 4''.

Figure 5 is a schematic cross-sectional view of the pore burner system 3' or pore burner 4'' according to Figure 3. According to it, the baffle plate 100 is arranged sloped in the same direction both in burner tube 24 and in the pore burner. For this purpose a uniform angle can be used, for example, in the range of 20 to 25°. As is apparent from Figures 4 and 5, the pore burner 4'' has a groove 18 incorporated in the pore burner material in the connection region with the burner tube, which is already sufficient to ensure reliable connection to the burner tube 24. It is likewise possible to provide a thread in the pore burner material in the region of the outer wall, which leads to a secure connection to a counter-thread applied to the burner tube 24.

Already with the depicted baffle plate 100 a gas mixture can be guided accordingly so that a locally limited pressure increase occurs in the region of the inside of the pore burner present as a hollow element. This design is also

advantageous to maintain a flame in a cold burner. If necessary, a blower is provided in order to introduce the gas mixture to the pore burner hollow element or an existing blower is equipped with increased power, since the pressure losses are generally increased by incorporation of a baffle plate.

The features of the invention disclosed in the previous description, in the drawings and in the claims can be essential both individually and in any combination for implementation of the invention in its different variants.

List of reference numbers

1	Cooking appliance
2	Internal space of the cooking appliance
3, 3'	Pore burner system
4, 4', 4''	Pore burner
6	Supply line
7, 7'	Dimensionally stable molded element
8	Base with thread
10	Wall of hollow cylindrical molded element
12, 14	Irregularities or grooves of the molded element
16	Surface of the molded element
18	Groove
22	Ignition source
24	Burner tube
26	Feed tube
28	Flange
34	Screw holes
36	Mount
100	Baffle plate